Java If-Else Statement

The **if-else** statement is one of the most fundamental decision-making structures in programming. It allows your program to execute different code based on whether a condition is true or false. In Java, we use the **if-else** statement to control the flow of execution depending on certain conditions.

In this blog, we'll explore how the **if-else** statement works in Java, provide explanations, and demonstrate examples with expected outputs.

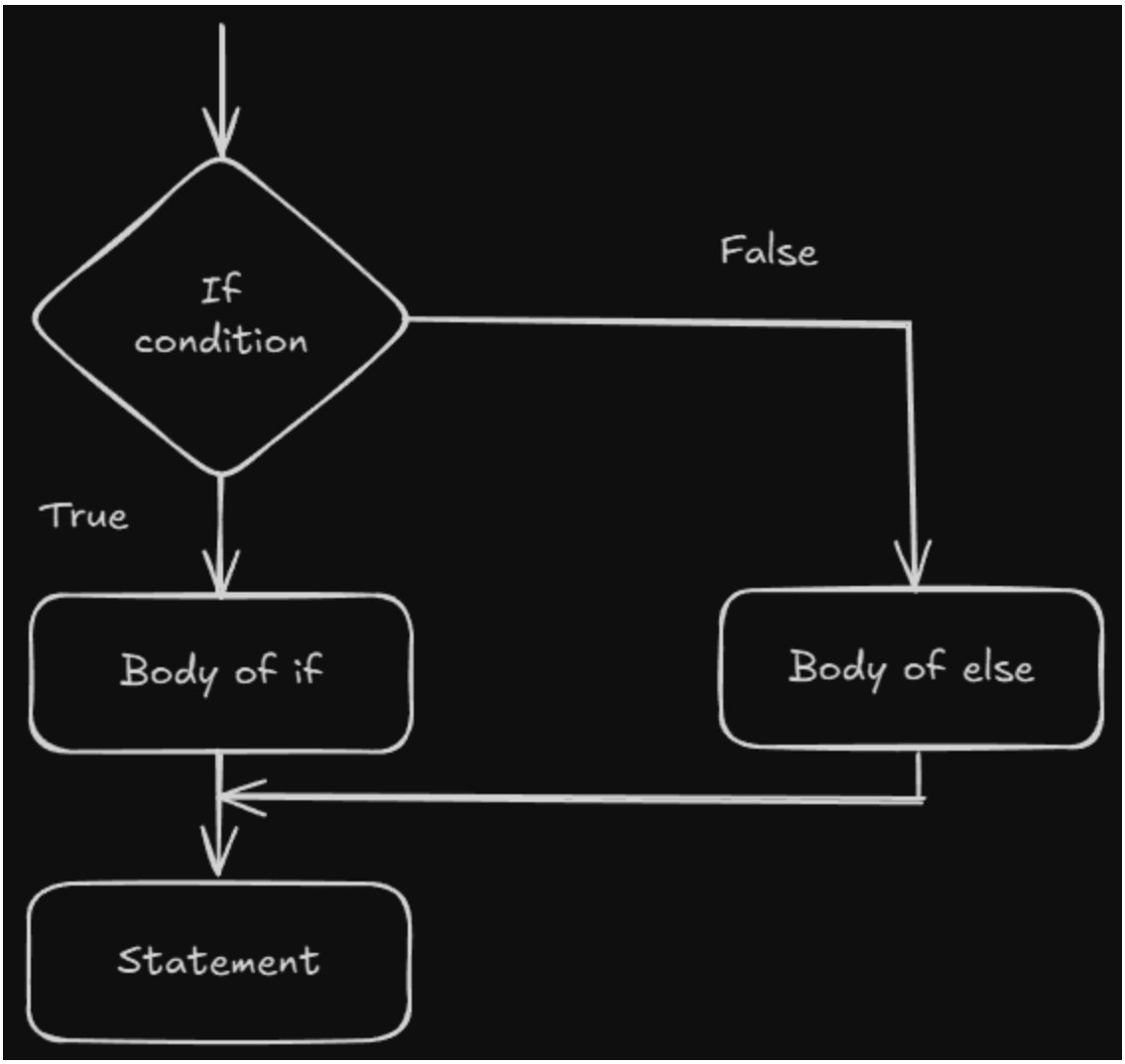
What is an If-Else Statement?

An **if-else** statement is used to execute one block of code if a condition is true, and another block if the condition is false. It's a way to introduce logic in your program, so it can make decisions.

The syntax for an if-else statement in Java is:

```
if (condition) {
    // code to be executed if the condition is true
} else {
    // code to be executed if the condition is false
}
```

Flow of Execution



If else flow chart

1. **If condition**: The condition inside the `if` is evaluated. If the condition is `true`, the block of code inside the `if` is executed.
2. **Else block**: If the condition is `false`, the block of code inside the `else` is executed.

Basic Example: If-Else Statement

Let's start with a simple example to see how the **if-else** statement works.

Example 1: Basic If-Else Statement

```
class Main {
  public static void main(String[] args) {
    int number = 10;

    // If-Else statement to check if number is positive or negative
    if (number > 0) {
      System.out.println("The number is positive.");
    } else {
      System.out.println("The number is negative.");
    }
  }
}
```

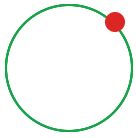
Explanation:

- The condition `number > 0` is evaluated. Since the value of `number` is 10, which is greater than 0, the condition is `true`, and the code inside the `if` block is executed.
- If the number was negative or zero, the code inside the `else` block would have been executed.

Expected Output:

```
The number is positive.
```

If-Else with Multiple Conditions: Using `else if`



Sometimes, we want to check for more than two conditions. In this case, we can use the `else if` statement to check additional conditions after the initial `if` condition.

Example 2: If-Else-If Statement

```
class Main {
  public static void main(String[] args) {
    int number = 0;

    // If-Else-If statement to check if the number is positive, negative, or
    if (number > 0) {
      System.out.println("The number is positive.");
    } else if (number < 0) {
      System.out.println("The number is negative.");
    } else {
      System.out.println("The number is zero.");
    }
  }
}
```

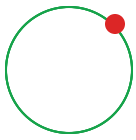
Explanation:

- The first condition checks if the number is positive. Since the number is 0, it moves to the `else if` condition and checks if the number is negative.
- Finally, since the number is neither positive nor negative, the `else` block is executed, and the program prints "The number is zero."

Expected Output:

```
The number is zero.
```

Nested If-Else Statement



A **nested if-else** statement is when you place an `if-else` statement inside another `if` or `else` block. This is useful when you have more complex conditions to check.

Example 3: Nested If-Else Statement

```
class Main {
  public static void main(String[] args) {
    int age = 18;

    // Nested if-else to check voting eligibility
    if (age >= 18) {
      if (age == 18) {
        System.out.println("You are 18 years old and eligible to vote for the
      } else {
        System.out.println("You are eligible to vote.");
      }
    } else {
      System.out.println("You are not eligible to vote.");
    }
  }
}
```

Explanation:

- The first `if` checks if the age is greater than or equal to 18.
- Inside the `if` block, there's another `if` that checks if the age is exactly 18.
- If the age is 18, it prints a specific message for first-time voters. Otherwise, it simply prints that the person is eligible to vote.

Expected Output:

```
You are 18 years old and eligible to vote for the first time.
```

If-Else with Logical Operators

You can also combine multiple conditions in an `if` statement using **logical operators** like `&&` (AND), `||` (OR), and `!` (NOT). This helps you to create more complex conditions.

Example 4: If-Else with Logical AND (&&)

```
class Main {
  public static void main(String[] args) {
    int age = 25;
    boolean hasVoterID = true;

    // If-Else with logical AND (&&) to check voting eligibility
    if (age >= 18 && hasVoterID) {
      System.out.println("You are eligible to vote.");
    } else {
      System.out.println("You are not eligible to vote.");
    }
  }
}
```

Explanation:

- The condition `age >= 18 && hasVoterID` checks if both conditions are true. Since both are true in this case (age is 25 and the person has a voter ID), the `if` block is executed.

Expected Output:

```
You are eligible to vote.
```

Example 5: If-Else with Logical OR (||)

```
class Main {
  public static void main(String[] args) {
```

```
    int age = 17;
    boolean hasParentalConsent = true;

    // If-Else with logical OR (||) to check voting eligibility with consent
    if (age >= 18 || hasParentalConsent) {
      System.out.println("You are eligible to vote.");
    } else {
      System.out.println("You are not eligible to vote.");
    }
  }
`
```

Explanation:

- The condition `age >= 18 || hasParentalConsent` checks if either the age is 18 or older or the person has parental consent.
- Since the person is 17 but has parental consent, the `if` block is executed.

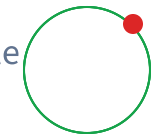
Expected Output:

```
You are eligible to vote.
```

Conclusion

In this blog, we've learned:

- The **if-else** statement allows you to make decisions in your program by checking conditions.
- The **if-else** structure can handle simple or multiple conditions using `if`, `else if`, and `els e`.
- We can also use **logical operators** like `&&` (AND) and `||` (OR) to combine multiple conditions.



- **Nested if-else statements** allow more complex logic.

Mastering the `if-else` statement is crucial for writing programs that make decisions based on data, and it's a fundamental concept in programming. With these building blocks, you can create powerful decision-making logic in your Java applications.

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